

Application of McCall et al.

We claim:

1. A method for capturing a spherical image comprising the steps of:

capturing a first hemispherical image via a first camera including a first hemispherical lens;

capturing a second hemispherical image via a second camera including a second oppositely directed hemispherical lens; and,

combining said first and second oppositely directed hemispherical images to create a spherical image.

2. The method according to claim 1 further including the step of transforming the spherical image to a perspective corrected spherical image.

3. The method according to claim 2, said transforming step occurring within a computer and said method further including the step of displaying the perspective corrected spherical image on a display of said computer.

4. A method for capturing and generating a spherical image comprising the steps of:

capturing a first image via a camera including a lens having a field-of-view of at least 180°;

creating a second image corresponding to a mirror image of the first image; and,

combining said first and second images to create a spherical image.

5. The method according to claim 4 further including the step of transforming the spherical image to a perspective corrected spherical image.

6. The method according to claim 5, said transforming step occurring within a computer and said method including the step of displaying the perspective corrected spherical image on a display of said computer.

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7. An apparatus for capturing a spherical image comprising:

a first camera equipped with a first 180° or greater field-of-view lens, said first camera and said first lens directed in a first direction, said first camera capturing a first image;

a second camera with a second 180° or greater field-of-view lens, said second camera and said second lens directed in a second direction opposite said first direction, said first and second cameras arranged in a back-to-back position, said second camera capturing a second image; and,

a combining system for combining said first and second images into a formed image.

8. The apparatus according to claim 7, said first and second cameras are single-use cameras whose backs are attached to each other through separable locking devices.

9. The apparatus according to claim 7, said first image is a 180° or greater field-of-view image and said second image is a 180° or greater field-of-view image.

10. The apparatus according to claim 9, said formed image is a complete spherical image.

11. The apparatus of claim 7, said first and second hemispherical lenses are optically connected to said first and second cameras through reflective optics.

12. The apparatus according to claim 7, wherein said first and second cameras are still cameras.

13. The apparatus according to claim 7, wherein said first and second cameras are video cameras.

14. The apparatus according to claim 7, wherein said first and second cameras are motion picture cameras.

15. The apparatus according to claim 7, wherein said first and second cameras are linear scanning CID camera arrays.

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16. The apparatus according to claim 7, wherein said first and second cameras are linear scanning CCD camera arrays.

17. The apparatus according to claim 7, wherein said first and second cameras are linear scanning CMOS APS camera arrays.

18. The apparatus according to claim 7, said first and second cameras including film exposed to said first and second images, said apparatus further comprising an optical-to-electrical converter converting said first and second images stored on said film into a form usable by said combining system.

19. The apparatus according to claim 7, said first and second hemispherical lenses connected to said first and second cameras though fiber optic lines.

20. The apparatus according to claim 7, said combining system for combining said first and second images further processes any overlap between said first and second hemispherical images to remove any edge distortion in creating said formed, spherical image.

21. An apparatus for capturing and forming a spherical image comprising:

a camera equipped with a 180° or greater field-of-view lens, said first camera capturing a first image;

a mirror image converter for converting said first image into a second image corresponding to a mirror image of the first image; and,

a combining system for combining said first and second images into a spherical image.

22. The apparatus of claim 21 where the camera is a single-use camera.

23. The apparatus of claim 21 including a transformer which transforms a selected portion of said spherical image to a perspective corrected spherical image.

24. The apparatus according to claim 23, said transformer disposed within a computer and containing hardwired perspective

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correction algorithms and said computer including a display for displaying said perspective corrected spherical image.

25. The apparatus according to claim 23, said transformer disposed within a computer, which contains perspective correction algorithms in software, and said computer including a display for displaying said perspective corrected spherical image.

26. A system for capturing a spherical image comprising:  
a first hemispherical lens including a first image plane and a first optical axis, said first hemispherical lens directed in a first direction;  
a second hemispherical lens, said second lens including a second optical axis and a second image plane, said second lens directed in a second direction opposite said first direction such that the first and second image planes fall between the first and second lenses and the first and second optical axes are collinear;

a first image capture device capturing an image from said first hemispherical lens;

a second image capture device capturing an image from said second hemispherical lens;

a combining system for combining said first and second images into a formed image.

27. The system according to claim 26, said first image is a hemispherical image and said second image is a hemispherical image.

28. The system according to claim 27, said formed image is a complete spherical image.

29. The apparatus according to claim 26, wherein said first and second cameras are still cameras.

30. The apparatus according to claim 26, wherein said first and second cameras are video cameras.

31. The apparatus according to claim 26, wherein said first and second cameras are motion picture cameras.

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32. The apparatus according to claim 26, wherein said first and second cameras are linear scanning CID camera arrays.

33. The apparatus according to claim 26, wherein said first and second cameras are linear scanning CCD camera arrays.

34. The apparatus according to claim 26, wherein said first and second cameras are linear scanning CMOS APS camera arrays.

35. An apparatus for capturing a spherical image comprising:

a first hemispherical lens having a first image plane and a first optical axis, said first lens directed in a first direction;

a second hemispherical lens having a second image plane and a second optical axis, said second lens directed in a second direction opposite said first direction such that the first and second image planes fall between the first and second lenses and the first and second optical axes are collinear;

a camera capturing a first image from said first hemispherical lens and capturing a second image from said second hemispherical lens; and,

a combining system for combining said first and second images into a formed image.

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